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Agency

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National Priority Chemicals Trends Report (2000-2004)

Section 4

Chemical Specific Trends Analyses for Priority Chemicals (2000–2004): Hexachloroethane (HCE)

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Hexachloroethane (HCE)

Chemical Information:

CAS Number – 67–72–1

Alternate Names – carbon hexachloride, ethane hexachloride, perchloroethane

General Uses – HCE is mostly used by the military to make weapons that produce smoke, such as smoke pots and grenades used during training. It is also present as an ingredient in fungicides, insecticides, lubricants and plastics.

Potential Hazards – HCE is highly toxic; it may be fatal if inhaled, swallowed or absorbed through the skin.

Summary Analysis:

- **NATIONAL:** In 2004, approximately 3.8 million pounds of HCE were reported by nine facilities; this was approximately a 34 percent decrease compared to the quantity reported in 2000. Since 2000, the quantity of HCE decreased until it increased by approximately 1.1 million pounds or 40 percent in 2004. One facility accounted for 80 percent of the total quantity.
- **REGIONAL:** Facilities in four EPA regions where facilities reported HCE in 2004; since 2000, most of the HCE was reported by facilities in Region 6, including approximately 99 percent of the total quantity in 2004.
- **STATES:** Facilities in Louisiana reported approximately 89 percent of the total quantity of HCE in 2004, including an increase of approximately 1.4 million pounds in 2004. Most of this increase was reported by a facility in Louisiana which attributed much of the increase to improved flow measurement equipment.
- **MANAGEMENT:** Since 2000, treatment has been the primary method used to manage HCE; in 2004 approximately 96 percent of this chemical was treated.
- **INDUSTRY SECTORS:** Facilities in SIC 2869 (Industrial organic chemicals, nec) and SIC 2812 (Alkalies and chlorine) reported approximately 95 percent of the total quantity of HCE in 2004.

National Trends:

Exhibit 4.117 shows the number of facilities that reported HCE in 2000 to 2004 and the quantities of this PC that were managed via disposal, treatment, energy recovery, and recycling. In 2004, approximately 3.8 million pounds of HCE were reported by nine facilities. Compared to the quantity reported in 2000, there was approximately a 34 percent decrease in 2004. Since 2000, the quantity of HCE showed a trend of decreasing until 2004, when the quantity increased by approximately 1.1 million pounds, or 40 percent.

Since 2000, treatment has been the primary method used to manage HCE; in 2004 approximately 96 percent of this chemical was treated. Significant quantities of HCE were recycled each year, including approximately 2.3 million pounds in 2003 and in 2004.

Exhibit 4.117. National Management Methods for Hexachloroethane, 2000–2004

Management Methods for HCE and Number of Facilities	2000	2001	2002	2003	2004	Percent Change (2000–2004)	Management Method -- Percent of Quantity of This PC (2004)
Number of Facilities	9	8	9	9	9	0.0%	-
Disposal Quantity (pounds)	2,482	233	306	254	263	-89.4%	0.0%
Energy Recovery Quantity (pounds)	1,245,190	455,985	206,953	139,929	146,243	-88.3%	3.9%
Treatment Quantity (pounds)	4,462,309	3,689,031	3,849,238	2,553,948	3,626,347	-18.7%	96.1%
Priority Chemical Quantity (pounds)	5,709,981	4,145,249	4,056,497	2,694,131	3,772,853	-33.9%	-
Recycling Quantity (pounds)*	1,027,963	850,000	3,530,419	2,336,505	2,279,804	121.8%	-
*Note: Waste minimization is the emphasis of this Report. As such, we primarily focus on quantities of PCs that are managed via onsite/offsite disposal, treatment, or energy recovery because we believe these PC quantities offer the greatest opportunities for waste minimization. Because recycled quantities of PCs are already directed to their best uses, they are considered separate and distinct from the quantities of PCs not recycled. Throughout this section, the recycled quantity is presented to provide some perspective regarding the quantity of this PC already recycled compared to the quantities that are managed via disposal, treatment, and energy recovery and thus potentially available for waste minimization							

Exhibit 4.118 shows the number of facilities that reported HCE within various quantity ranges. Of the nine facilities that reported HCE in 2004, one facility accounted for 80 percent of the total quantity and five facilities reported approximately 97 percent of the total quantity of this chemical.

Exhibit 4.118. Distribution of Quantities by Facilities Reporting Hexachloroethane, 2004

HCE (3,772,853 pounds)		
Quantity Reported	Number of Facilities Reporting This Quantity (2004)	Percent of Total Quantity of This PC (2004)
up to 10 pounds	0	0.0%
11 – 100 pounds	0	0.0%
101 – 1,000 pounds	1	less than 0.1%
1,001 – 10,000 pounds	0	0.0%
10,001 – 100,000 pounds	3	2.7%
100,001 – 1 million pounds	4	17.9%
> 1 million pounds	1	79.4%

EPA Regional Trends:

Exhibits 4.119 and 4.120 show the quantity of HCE for those five EPA regions where facilities reported this PC in 2000–2004; in 2004 facilities in only four regions reported HCE. Since 2000, most of the HCE was reported by facilities in Region 6, including approximately 99 percent of the total quantity in 2004. From 2000 to 2003 the quantity of HCE steadily decreased; however, in 2004 the quantity increased by approximately 1.1 million pounds, or 40 percent. Most of this increase was reported by a facility in Louisiana which attributed much of the increase to improved flow measurement equipment. A facility located in Oregon (Region 10) that only began reporting HCE in 2003 reported a decrease of approximately 73,000 pounds or 80 percent in 2004.

Exhibit 4.119. Regional Quantities of Hexachloroethane, 2000–2004

EPA Region	2000 (pounds)	2001 (pounds)	2002 (pounds)	2003 (pounds)	2004 (pounds)	Percent Change in Quantity (2000–2004)	Percent of Total Quantity of This PC (2004)
4	0	0	84,900	0	0	NA	0.0%
5	70,764	63,652	63,076	11,549	11,529	–83.7%	0.3%
6	5,638,985	4,081,334	3,907,982	2,590,994	3,742,765	–33.6%	99.2%
7	232	263	539	333	693	198.7%	0.0%
10	0	0	0	91,255	17,867	NA	0.5%
Total	5,709,981	4,145,249	4,056,497	2,694,131	3,772,853	–33.9%	100.0%

Exhibit 4.120. Distribution of Facilities Reporting Hexachloroethane in 2004 and the Quantities of Hexachloroethane Reported in 2004, by EPA Region

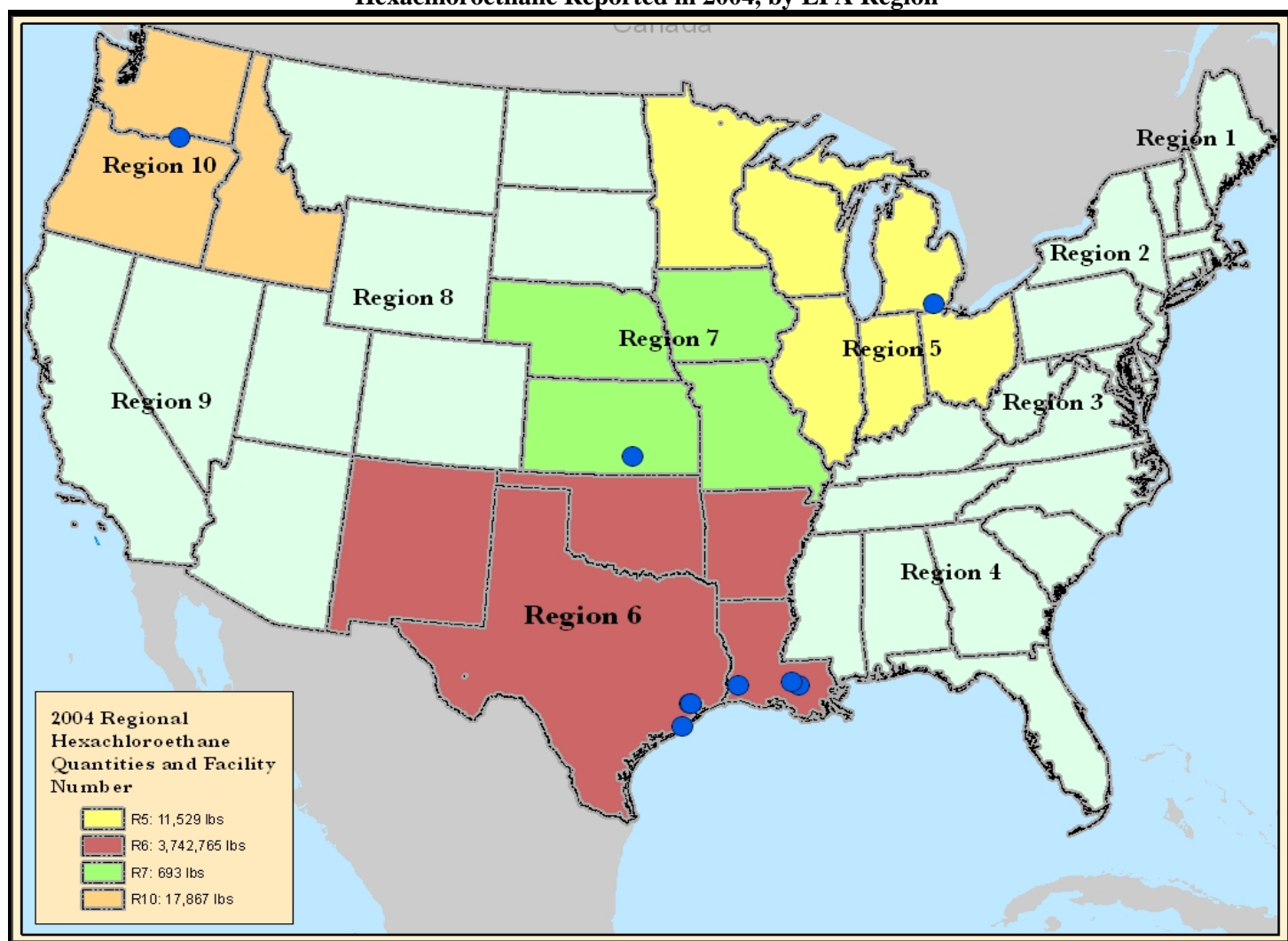


Exhibit 4.121 shows how HCE was managed by facilities in the four EPA regions in 2004. In 2004, approximately 99 percent of the HCE was treated, mostly onsite — by facilities in Region 6. Facilities in Regions 7 and 10 also primarily treated HCE. One facility in Region 5 used offsite energy recovery for all of its HCE. A relatively small quantity of HCE was land disposed. HCE was recycled by facilities in Regions 5 and 6; facilities in each of these two regions recycled a significant quantity compared to the quantity otherwise managed via land disposal, treatment, or energy recovery.

State Trends:

Exhibit 4.122 shows the quantity of HCE reported by facilities in seven states from 2000 to 2004. Facilities in Louisiana accounted for approximately 89 percent of the total quantity of this chemical in 2004, including an increase of approximately 1.4 million pounds in 2004. Most of this increase was reported by a facility in Louisiana which attributed much of the increase to improved flow measurement equipment.

Although Texas facilities reported approximately 11 percent of the total quantity in 2004, they reported a decrease of approximately 2.8 million pounds, or 87 percent, compared to the quantity reported in 2000. Likewise, a facility in Oregon reported a significant decrease from the quantity it reported in 2003. A facility in Michigan reduced its HCE by approximately 83 percent since 2000.

Exhibit 4.121. Regional Management Methods for Hexachloroethane, 2004

EPA Region	Quantity (pounds) of HCE (2004)	Percent of HCE (2004)	Disposal (pounds)		Energy Recovery (pounds)		Treatment (pounds)		Recycling (pounds)	
			Onsite Disposal	Offsite Disposal	Onsite Energy Recovery	Offsite Energy Recovery	Onsite Treatment	Offsite Treatment	Onsite Recycling	Offsite Recycling
6	3,742,765	99.2%	30	3	134,714	0	3,534,174	73,844	2,237,150	0
10	17,867	0.5%	0	4	0	0	12,813	5,050	0	0
5	11,529	0.3%	0	0	0	11,529	0	0	0	42,654
7	693	0.0%	227	0	0	0	0	466	0	0
Total	3,772,853	100.0%	257	7	134,714	11,529	3,546,987	79,360	2,237,150	42,654

Exhibit 4.122. State Quantity Trends for Facilities Reporting Hexachloroethane, 2000–2004

State	Total Quantity (pounds) of Hexachloroethane					Change in Quantity (2000–2004)	Percent Change in Quantity (2000–2004)	Percent of Total Quantity of This PC (2004)
	2000	2001	2002	2003	2004			
LA	2,454,853	1,506,255	918,178	1,945,275	3,342,716	887,863	36.2%	88.6%
TX	3,184,132	2,575,079	2,989,804	645,719	400,049	–2,784,083	–87.4%	10.6%
OR	0	0	0	91,255	17,867	17,867	NA	0.5%
MI	68,464	63,652	63,076	11,549	11,529	–56,935	–83.2%	0.3%
KS	232	263	539	333	693	461	198.7%	0.0%
AL	0	0	84,900	0	0	0	NA	0.0%
IN	2,300	0	0	0	0	–2,300	–100.0%	0.0%
Total	5,709,981	4,145,249	4,056,497	2,694,131	3,772,853	–1,937,128	–33.9%	100.0%

Exhibits 4.123 through 4.126 show the trends for the quantities of HCE in the top five states in which facilities reported this PC in 2004.

Exhibit 4.123. Louisiana and Texas Trends for Hexachloroethane, 2000–2004

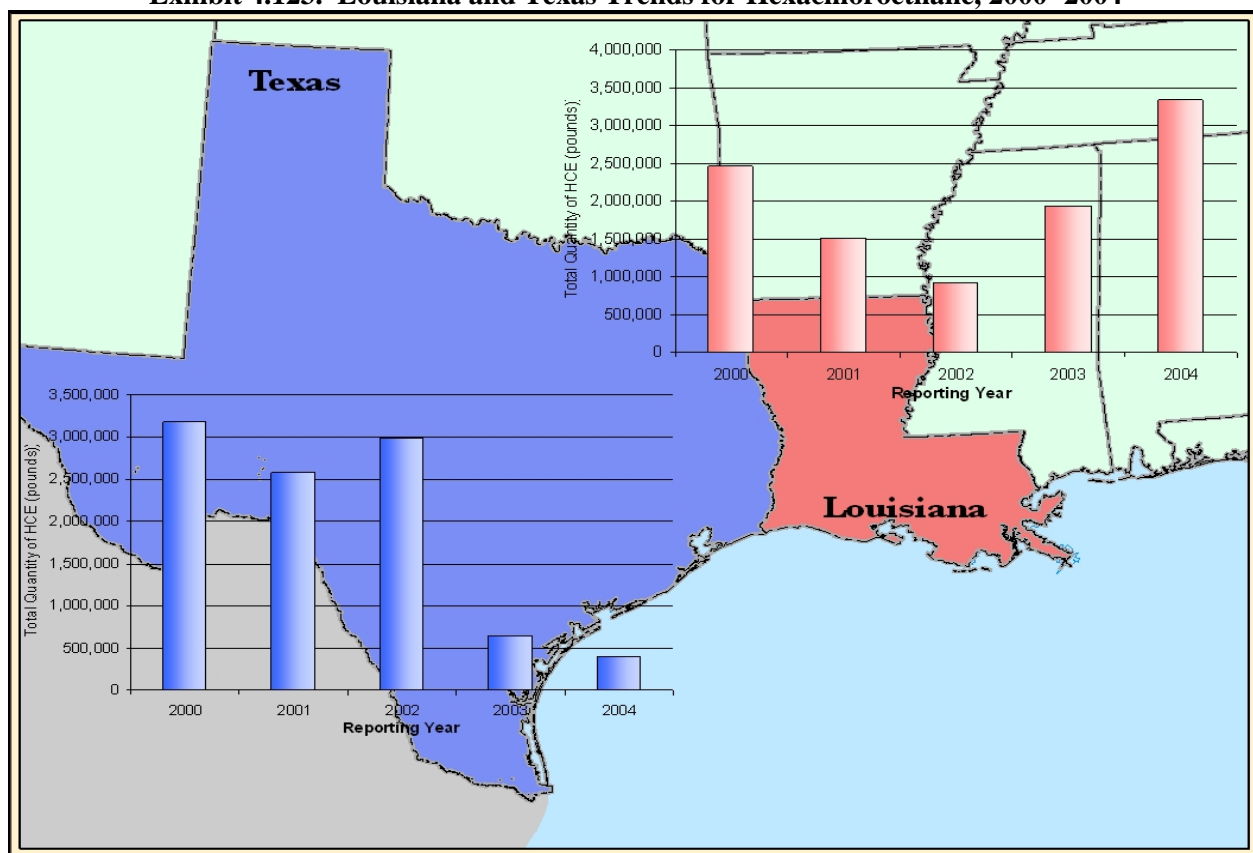


Exhibit 4.124. Oregon Trends for Hexachloroethane, 2000–2004

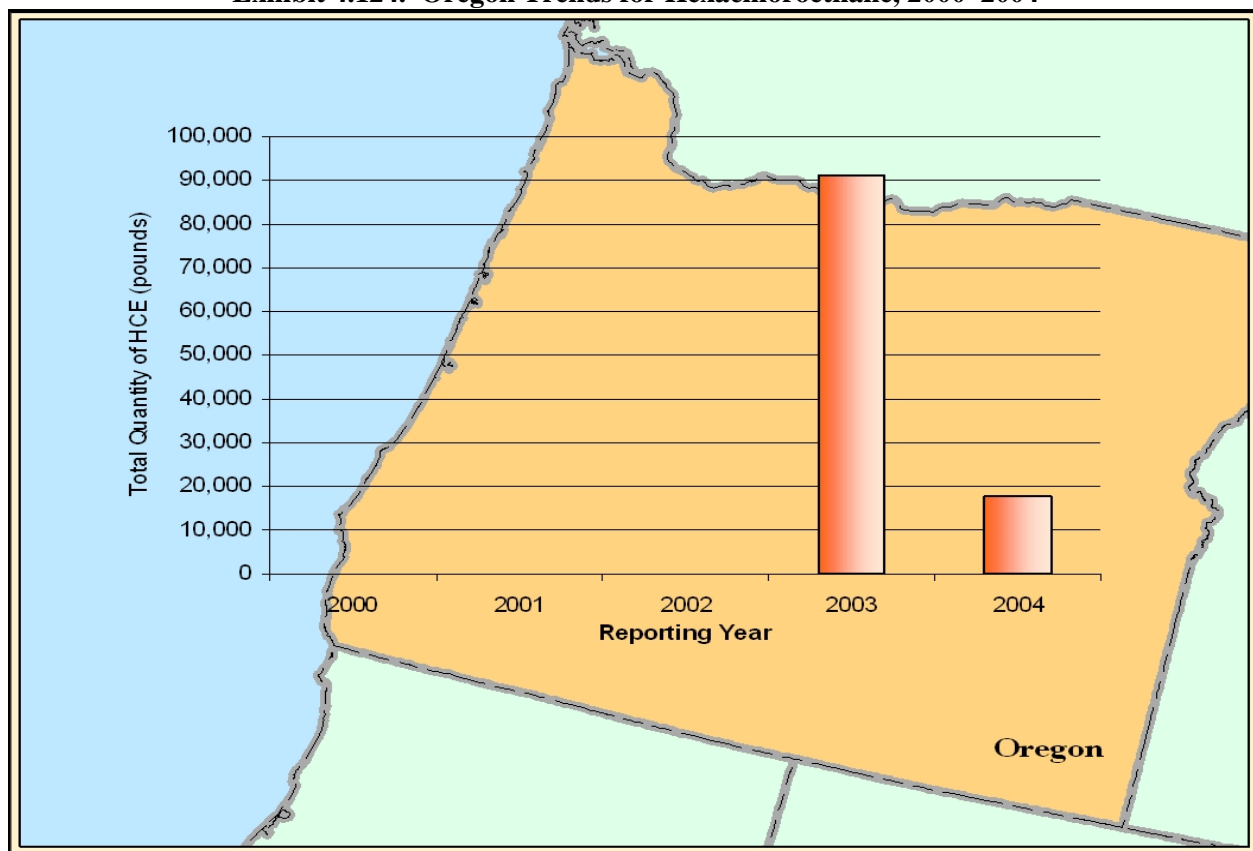


Exhibit 4.125. Michigan Trends for Hexachloroethane, 2000–2004

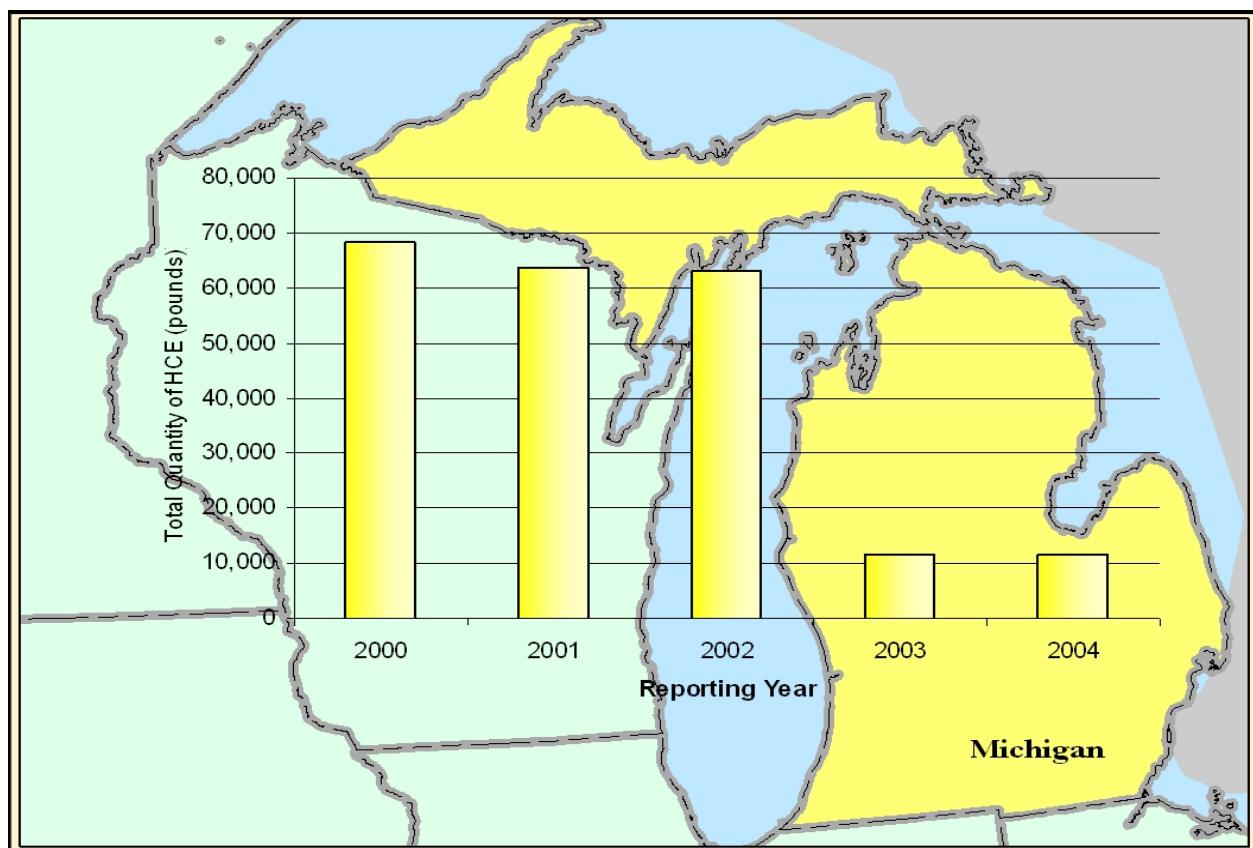
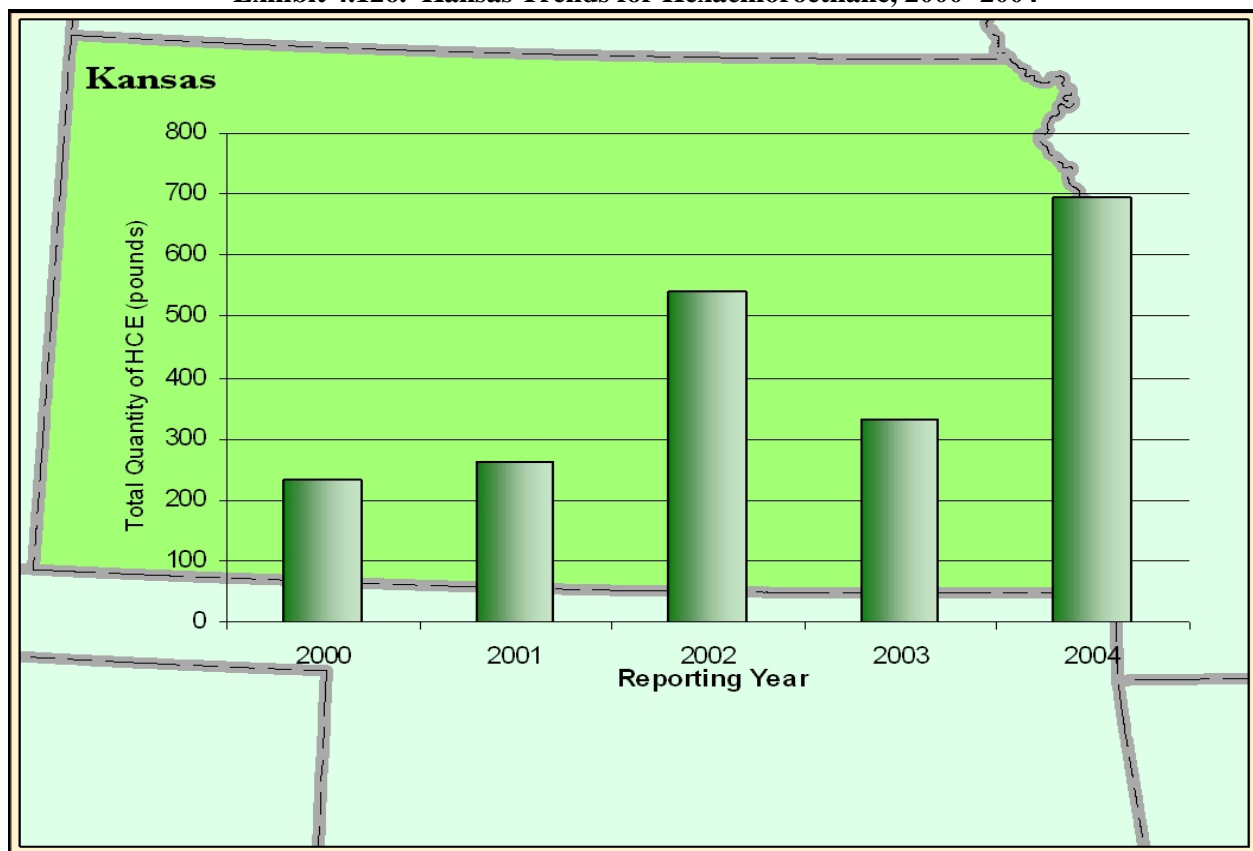


Exhibit 4.126. Kansas Trends for Hexachloroethane, 2000–2004

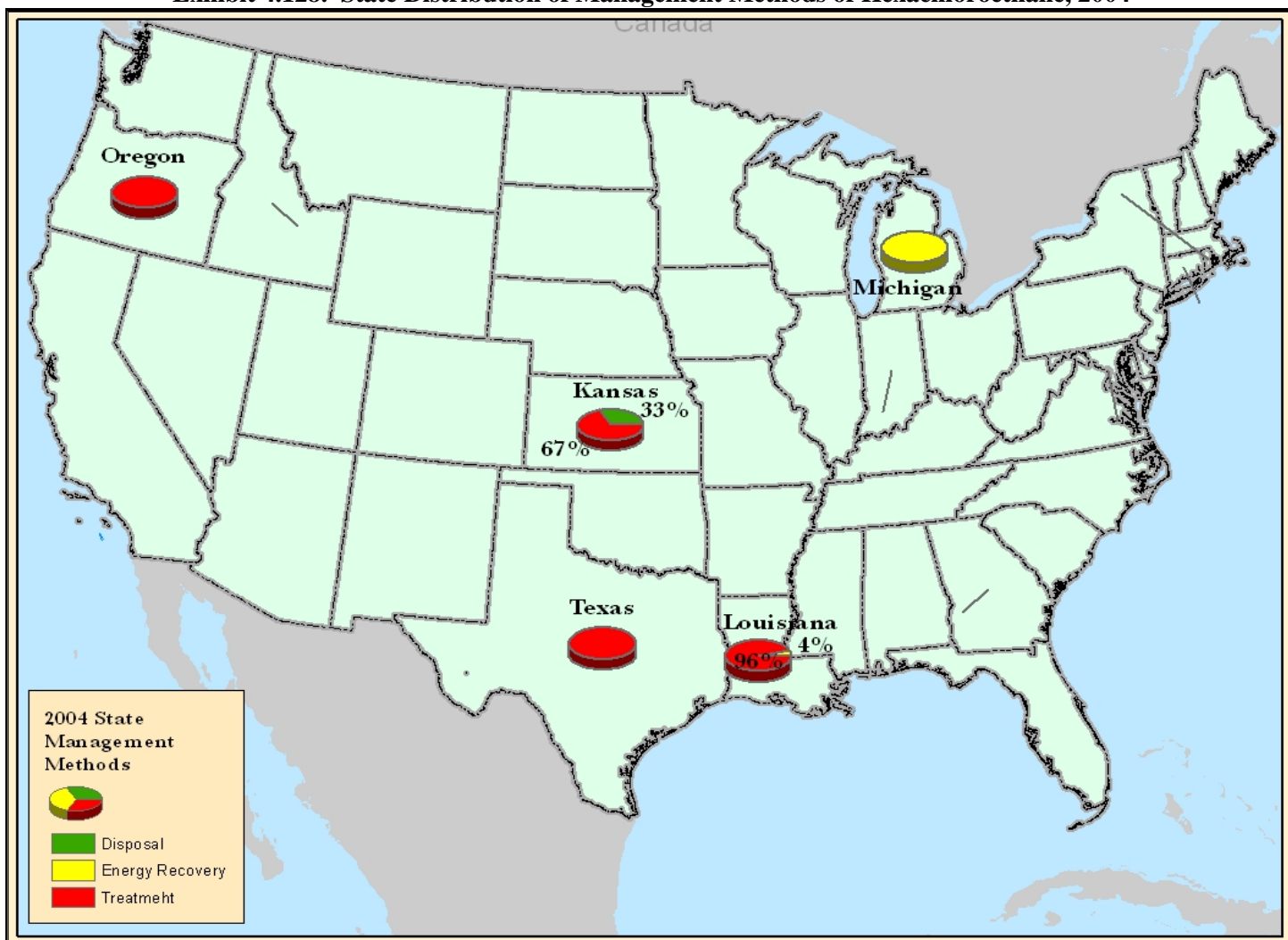


Exhibits 4.127 and 4.128 show how HCE was managed by facilities in the two states in which facilities reported approximately 99 percent of the total quantity of HCE in 2004. Facilities in both these states primarily used onsite treatment to manage the HCE and reported similar recycled quantities.

Exhibit 4.127. Management Methods for Hexachloroethane, Facilities in States With 99 Percent of the Total Quantity, 2004

State	Total Quantity (pounds) of HCE (2004)	Onsite Disposal (pounds)	Offsite Disposal (pounds)	Onsite Energy Recovery (pounds)	Offsite Energy Recovery (pounds)	Onsite Treatment (pounds)	Offsite Treatment (pounds)	Onsite Recycling (pounds)	Offsite Recycling (pounds)
LA	3,342,716	1	0	134,714	0	3,206,938	1,063	1,100,000	0
TX	400,049	29	3	0	0	327,236	72,781	1,137,150	0

Exhibit 4.128. State Distribution of Management Methods of Hexachloroethane, 2004



Industry Sector (SIC) Trends:

Exhibit 4.129 shows the quantity of HCE for the six industry sectors where facilities reported this chemical in 2000–2004.

- Facilities in SIC 2869 (Industrial organic chemicals, nec) and SIC 2812 (Alkalies and chlorine) reported approximately 95 percent of the total quantity of HCE in 2004.
- Since 2002, the quantity of HCE reported by facilities in SIC 2869 increased by approximately 1.1 million pounds. Part of this increased quantity was due to a change in the primary SIC code (from SIC 2812 to SIC 2869) by one of the larger facilities reporting HCE in 2002; the same facility also attributed much of the large increase in 2004 to improved flow measurement equipment at its facility. Conversely, this SIC change caused the SIC 2812 quantity to decrease in 2002. The quantity for SIC 2812 also decreased due to a large decrease in the reported quantity by one of the larger facilities in this industry sector and that facility's subsequent change in primary SIC code (from SIC 2812 to SIC 2821) in 2004. This SIC change, in turn, caused a significant increase in the quantity reported by SIC 2821 facilities in 2004.
- A facility in SIC 9711 (National security) that only began reporting HCE in 2003 reported a decrease of approximately 73,000 pounds or 80 percent in 2004. This facility reduced its use of HCE as a "surrogate" in trial burns done to ensure proper operation of its incinerators.

Exhibit 4.129. Industry Sectors in Which Facilities Reported Hexachloroethane, 2000–2004

Primary SIC	SIC Description	Number of Facilities That Reported HCE (2004)	2000 (pounds)	2001 (pounds)	2002 (pounds)	2003 (pounds)	2004 (pounds)	Change in Quantity (2000–2004)	Percent of Total Quantity of This PC (2004)
2869	Industrial organic chemicals, nec	3	483,682	266,064	801,027	1,900,386	3,229,682	2,746,000	85.6%
2812	Alkalies and chlorine	3	5,155,535	3,815,533	3,107,494	690,941	346,543	–4,808,992	9.2%
2821	Plastics materials and resins	2	68,464	63,652	63,076	11,549	178,762	110,298	4.7%
9711	National security	1	0	0	0	91,255	17,867	17,867	0.5%
3365	Aluminum foundries	0	2,300	0	0	0	0	–2,300	0.0%
3795	Tanks and tank components	0	0	0	84,900	0	0	0	0.0%
Total		9	5,709,981	4,145,249	4,056,497	2,694,131	3,772,853	–1,937,128	100.0%

Exhibit 4.130 shows how HCE was managed by the nine facilities in the four industry sectors that reported this chemical in 2004. Facilities in these four industry sectors used onsite treatment for approximately 94 percent of the HCE. Facilities in SIC 2812 (Alkalies and chlorine) used onsite energy recovery for approximately 27 percent of their HCE. Only approximately 500 pounds of HCE were land disposed. Two facilities, one each in SIC codes 2812 and 2821, reported approximately 98 percent of 2.2 million pounds of HCE recycled in 2004.

Exhibit 4.130. Management Methods for Hexachloroethane in Industry Sectors, 2004

Primary SIC	SIC Description	Total Quantity of HCE (2004)	Percent of Total Quantity (2004)	Disposal		Energy Recovery		Treatment		Recycling	
				Onsite Disposal (pounds)	Offsite Disposal (pounds)	Onsite Energy Recovery (pounds)	Offsite Energy Recovery (pounds)	Onsite Treatment (pounds)	Offsite Treatment (pounds)	Onsite Recycling (pounds)	Offsite Recycling (pounds)
2869	Industrial organic chemicals, nec	3,229,682	85.6%	0	3	40,885	0	3,117,360	71,434	0	0
2812	Alkalies and chlorine	346,543	9.2%	228	0	93,829	0	250,957	1,529	1,100,000	0
2821	Plastics materials and resins	178,762	4.7%	29	0	0	11,529	165,857	1,347	1,137,150	42,654
9711	National security	17,867	0.5%	0	4	0	0	12,813	5,050	0	0
Total		3,772,853	100.0%	257	7	134,714	11,529	3,546,987	79,360	2,237,150	42,654